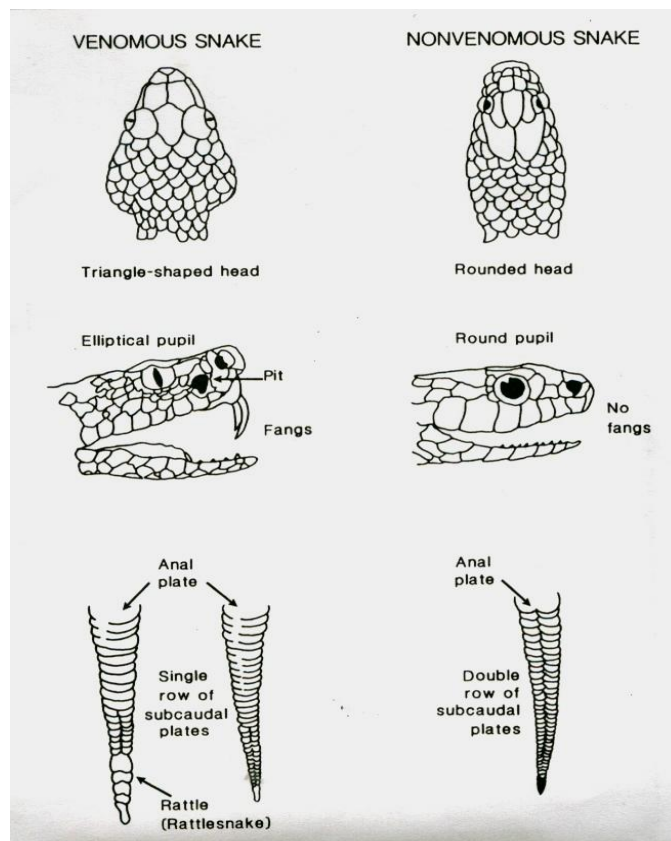


Animal Poisoning

Snake Bite

Incidence

- Less than 50 % of snake bites are poisonous
- Less than 20 % of bites by poisonous vipers result in envenomation.
- Bites by Cobra may result in no envenomation



Types of common Poisonous Snakes

1- Viperidae

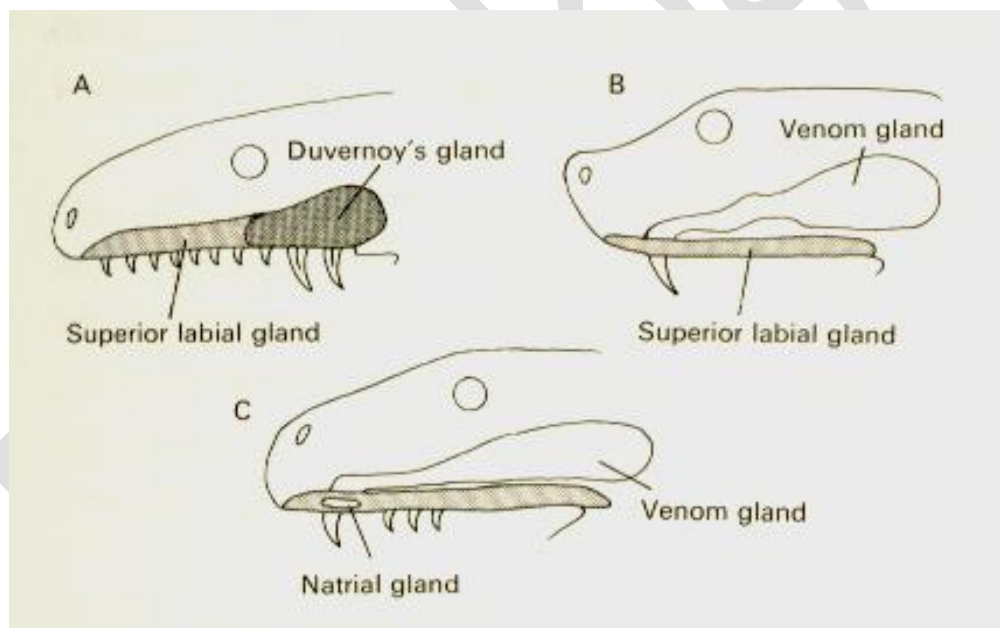
- Cerastes cerastes
- Echis carinatus
- Echis coloratus

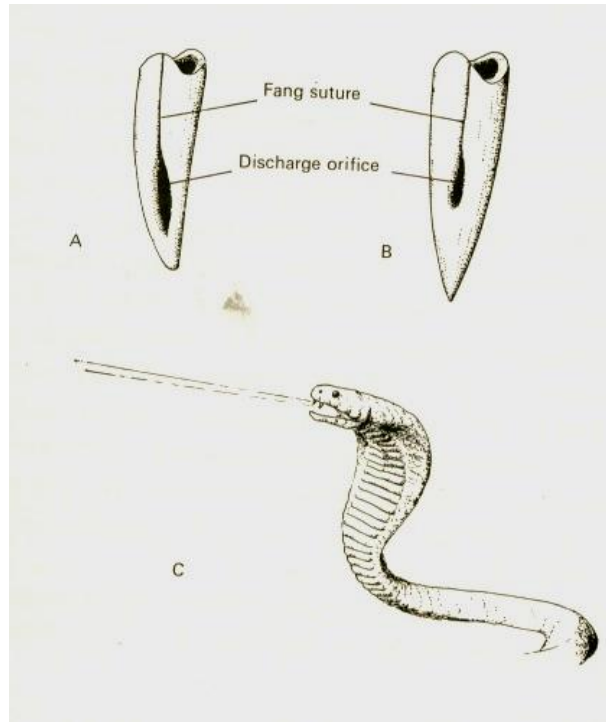
2- Elapidae

- Naja haje (Egyptian Cobra)
- Naja nigricollis (Black Spitting Cobra)

Behavior and Senses

- Snakes strike from the coiled position . Strike speed is 2 meters/ sec.
- Reflex bites may occur up to 1 hour after snake dies.
- Best sensory modalities are vibration and smell followed by thermal change. Snakes are deaf and have poor vision.
- Cobra live in a humid environment while vipers distribute in all the desert
- Venom is injected in the victim through 2 fangs situated in front of upper teeth .Venom gland is connected to the tips of fangs by narrow ducts carrying the venom





Venom Composition and Effects

1- Hyaluronidase

- Facilitate the rapid spread

2- Proteases

- Local tissue destruction
- Necrosis
- Edema

3- Phospholipases

- Disrupt neurotransmission
- Hemolysis

4- Neurotoxins

- With phospholipases they produce respiratory paralysis

5- Small peptides

- DIC
- Platelet aggregation
- Thrombocytopenia

6- Thrombin like enzymes

- Formation of microthrombi
- Fibrinogen depletion
- Fibrinolysis
- Formation of Fibrin Degradation Products (FDP)
- Anticoagulation

7- Serotonin and bradykinin

- Hypotension
- Capillary leak
- Non cardiogenic Pulmonary Edema (NCPE)

Manifestations

I- Local manifestations

- Fang marks: one or two punctures at the site of the bite
- Mild local pain
- Local edema occurs within 5 minutes and may progress to involve the whole limb within 1 hour
- Tender regional lymph nodes

In addition vipers produce the following:

- Echymosis
- Vesicles and petechiae
- Skin necrosis and gangrene

Systemic Manifestations

A- Elapidae (cobra)

- Gradual progressive muscle weakness up to paralysis of the whole body including respiratory muscles with cranial nerves palsy is the main and may be the only manifestation of Cobra envenomation .
- Paralysis may be preceded by fasciculations of face and neck muscles
- It starts 1-4 hours but may start as late as 12 hours

- Consciousness and sensations are retained
- Local manifestations are milder than in viper bites

B- Viperidae

1- General manifestations:

- Sweating , rigors, nausea, vomiting, metallic taste and hypertension (hypotension may occur late in complicated cases).

2- Non Cardiogenic Pulmonary Edema

3- Congestive heart failure

4- Renal failure

5- Coagulopathy

A- Localised

- Hypofibrinogenemia and thrombocytopenia may occur without significant coagulopathy.
- Thrombocytopenia reaches maximum after 2-4 days and may last for 1 week.
- Fibrinolysis may be absent (no Fibrin Degradation Products FDP).
- Bleeding tendency is mild with anemia and hypotension.

B- Disseminated

- ❖ Full blown consumption coagulopathy.
- ❖ It is a lethal picture that usually reaches hospital in very serious condition or commonly dies before reaching it.
- ❖ Patient presents with petechiae , bleeding from all orifices and site of the bite.
- ❖ Laboratory results show:
 - Very high PTT, very low platelets and fibrinogen, high FDPs and anemia.

- It is usually complicated by multiple organ failure, ARDS, renal failure and shock

Treatment

A- First aid measures

- ✓ Reassurance of the patient
- ✓ Immobilization of the affected limb
- ✓ Light tourniquet may be applied proximal to site of the bite

B- At hospital

I- Stabilization of the patient

II- Antidote: Polyvalent Antivenom

- ✓ It neutralizes the venom but don't reverse local injury
- ✓ It should be given within the first 4 hours to prevent local injury
- ✓ Skin sensitivity test must be done before administration.
- ✓ Initial dose is 3 - 5 vials to be repeated according to the severity and the follow up of the patient.
- ✓ It is given in normal saline up to 1: 1 dilution.

III- Supportive treatment

- ✓ IV Fluids for hypotension
- ✓ Blood for bleeding and hemolysis
- ✓ Platelets concentrates
- ✓ Fresh frozen plasma to replenish coagulation factors
- ✓ Artificial ventilation for the paralytic syndrome of Cobra or the pulmonary edema of vipers
- ✓ Antibiotics and antitetanic serum

Care of the wound

- ✓ Cleansing, debridement of necrosed tissues and fasciotomy if peripheral vascular impairment follow limb edema and compartment syndrome.

Scorpion Sting

- Scorpions are yellowish, brown or black in colour.
- They live in desert, hide at day time under rocks and stones and emerge at night for hunting.
- Scorpions are blind but possess sensitive thermoreceptors.
- Accidents predominate in summer, rare in winter when scorpions are hibernating.



Pathogenesis

1. Excessive catecholamine release
2. Acetyl choline release
3. Release of kinins and serotonin
4. Direct central toxic effect
5. Direct peripheral effect
 - Myocarditis
 - NCPE

Clinical Picture

A- Factors affecting severity

1- Age

- Serious manifestations are seen in infants (younger age),

2- Site of sting

- Stings affecting central location (neck , back , face) are more dangerous

3- Number of stings

- Victims receiving more than one sting usually show more severe manifestations

B- Onset of manifestations

- Rapid
- Severe sting produces symptoms within half an hour.

Manifestations

I- General

- Agitation
- Fever
- Sweating
- Dehydration
- Conjunctival congestion
- Peripheral cyanosis
- Cold extremities (2ry to peripheral vasospasm caused by catecholamines)
- Priapism.

II- Local

- Severe local pain
- Tender regional lymph nodes
- Numbness

III- Neurological

- Confusion and agitation
- Tremors, fasciculations and rigors
- Convulsions

- Hypertensive encephalopathy
- Coma
- Malignant hyperthermia (> 41 C)
- Cranial nerve palsy:
 - 6th Nerve is usually affected
 - Reversible
 - Secondary to cerebral edema

IV- Cardiovascular

- Tachycardia
- Hypertension
- Myocarditis
- Shock : usually follow severe myocarditis
- Cardiac Arrest

V- Respiratory

- Tachypnea
- Respiratory distress and respiratory failure
- Acute pulmonary edema:

VI- Gastrointestinal

- Severe vomiting and diarrhea
- Gastric distension
- Acute erosive gastritis , hematemesis and melena

VII- Metabolic

- Metabolic acidosis
- Hyperkalemia
- Stress hyperglycemia

Manifestations of Grave Prognosis

1. Acute pulmonary edema
2. Respiratory failure
3. Myocarditis
4. Metabolic acidosis

5. Malignant hyperthermia

6. Convulsions

Management

A- First aid measures

B- At hospital

I- Stabilization of the patient

II- Antidote

- Best given in the first 4 h but can still be given as late as 24 hours_

Indications

- All children, and senile patients
- Adults presenting with any of the systemic manifestations
- Patients with previous cardiovascular disease, hypertension or diabetes

Dose

Adult

- 3 - 5 amp slow IV or IM after negative skin sensitivity test to be repeated every 30 minutes if signs still progress or do not regress

Pediatric

- The same dose as adults (Dose is not related to body weight but to neutralizing power of the circulating venom)

III- Supportive treatment

Pain

- NSAIDs
- Local anesthesia.

Corticosteroids_

Indications

- Stridor
- Myocarditis
- Non cardiogenic pulmonary edema
- Cranial palsy (cerebral edema)

IV vasodilators

- To control hypertension
- Careful monitoring of the patient to avoid hypotension or shock that may occur with catecholamine depletion or after myocarditis.
- They include Na nitroprusside, hydralazine or prazosin

Mechanical ventilation_

Indications

- Respiratory failure
- Non cardiogenic pulmonary edema in which PEEP mode is used.

Dehydration, hypotension and shock

- IV fluids
- Dobutamine if cardiogenic shock 2ry to myocarditis complicates the picture

Anticonvulsants e.g. diazepam

Malignant hyperthermia

- Cooling measures and chlorpromazine

Spider Sting

The most important is the *black widow spider* of Mediterranean distribution .



Manifestations

- Local pain
- Profuse sweating
- Severe myalgia
- Weakness and rhabdomyolysis.
- Excess catecholamine release with hypertension, irritability, tachycardia and vomiting

Treatment

- Supportive

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